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## Socioeconomic status and the course of quality of life in coronary heart disease and cancer

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# Chapter 6

## Conclusions

The introduction of this thesis described the impact of chronic conditions such as cancer and coronary heart disease (CHD) on the quality of life (QoL) of patients. It discussed socioeconomic status (SES) as an important determinant of the incidence and mortality of these illnesses, because SES is related to material and psychosocial resources which are influential for physical health and general well-being. It has therefore been hypothesized that SES might also determine the course of QoL in cancer and CHD patients after the onset of the disease. Furthermore, it has been postulated that psychosocial resources such as perceived control might be the mediating factors between SES and a differential response in specific domains of QoL.

This final chapter will summarize and discuss the main findings of this thesis, beginning with an analysis of the relation between SES and the course of QoL in cancer and CHD, followed by an examination of any mediating effect of perceived control. Methodological considerations will be discussed, as well as clinical implications and recommendations for future research.

## **Main findings**

### *Part 1*

The first part of this book (Chapters 2, 3 and 4) described the course of QoL in cancer and CHD patients according to their SES. Specifically, socioeconomic differences in psychological, functional and physical domains were explored cross-sectionally, by comparing socioeconomic groups at different stages of the disease (short-, intermediate- and long-term assessments), and longitudinally, by considering temporal changes in QoL.

The main aim of *Chapter 2* was to examine the adaptation process of cancer patients in relation to their SES (measured in terms of educational level). A pre-morbid measurement of QoL was used as a reference point to assess the patients' adaptation to cancer during the 12 months after diagnosis. In this study,

adaptation was defined as the patients' ability to return to their pre-morbid level of QoL. Unexpectedly, there were no significant educational differences in the adaptation process in any area of QoL. However, it was possible to observe different trends of adaptation in role and physical functioning. In both cases, high-educated patients were more likely to adapt completely to the disease compared to those who had a lower education.

The unique prospective design of the study and operationalization of the adaptation process provided a detailed description of the extent and speed of recovery in cancer patients, something that has not been properly addressed in previous research.

In addition, the QoL of patients of different educational levels was compared at different assessment points. Cross-sectional disparities between educational groups were mainly found in physical functioning: high-educated patients reported higher levels of physical functioning at 6 and 12 months after diagnosis with cancer. These results support previous findings on adaptation, confirming that SES differences can lead to dissimilar outcomes, particularly in the physical domain. This is evident at least in the short and medium period after diagnosis, whereas in the long term such disparities disappear. Regarding this last point, the present research is in line with most of the literature on SES and adaptation to cancer. Recent studies have confirmed that patients with low and high SES show different outcomes in some domains of QoL on short and intermediate time scales, whereas in the long term they adapt equally well to the consequences of the disease (Penson et al., 2001; Simon & Wardle, 2008). More generally, regarding the sample as a whole, it is apparent that most patients completely adapted to the disease in all domains of QoL, independent of their socioeconomic background.

*Chapter 3* investigated cross-sectionally and longitudinally the course of QoL in CHD patients with different SES. A pre-morbid measurement of the patients' QoL allowed us to analyze these results prospectively. Patients with high SES reported

more favourable outcomes in most domains of QoL. Socioeconomic disparities were reported at different time points in different domains. Regarding depressive feelings, socioeconomic-related inequalities present in the pre-morbid measurement disappeared after diagnosis of disease, which means that the onset of CHD actually reduced the socioeconomic gap in this domain, rather than emphasizing it.

Regarding functional status, disparities in SES were reported in the medium and long term (6 and 12 months after the diagnosis) in physical functioning and in the long term in social and role functioning. Importantly, socioeconomic differences in physical functioning also existed pre-morbidly. These findings reveal that post-morbid differences in QoL are regulated by two different mechanisms. Socioeconomic disparities in physical functioning are not a direct consequence of CHD, but rather a pattern established before the onset of the illness. In social and role functioning, however, such socioeconomic differences seem to represent a differential response to the disease. Cross-sectional differences in functional domains were confirmed by longitudinal analysis, which revealed differing pathways in the course of social, role and physical functioning between CHD patients with high and low SES.

This study showed that CHD patients report negative outcomes mostly in the functional domains. Moreover, it is quite clear that in order to evaluate properly the buffering effect of SES on the consequences of the disease, it is necessary to consider the pre-morbid situation of the patients.

*Chapter 4* explored in detail the cross-sectional and longitudinal differences in QoL in relation to SES (measured in terms of educational level) in a large sample of heart failure (HF) patients. The patients were followed from hospitalization to 18 months after discharge and changes in QoL within this interval were tested among groups with different educational levels. Cross-sectional results showed more favourable outcomes for high-educated patients in physical and functional

domains (energy, physical functioning, social functioning and limitation in role functioning due to emotional problems). In most of the analyses, significant differences were found when the high-educated patients were compared to the low- and the very low-educated ones. Longitudinal disparities were only present in relation to limitations in role functioning due to emotional problems, where high-educated patients significantly improved compared to patients with lower education. The numerous cross-sectional and longitudinal inequalities between educational groups in this aspect of QoL were not supported by corresponding differences in relation to 'emotional well-being'. These results suggest that the same level of psychological distress produced greater limitation in role functioning in those with lower education compared to the high-educated group. According to the reserve capacity model, people with low SES are more exposed to distressing situations which erode the resources available and prevent their replenishment (Gallo & Matthews, 2003). Furthermore, long-term exposure to stressors reduces the resources available over time, leaving the individual even more vulnerable to new stressful situations (Ensel & Lin, 1991). Applying this model to the present study, it is possible to conclude that HF patients of lower educational levels are more prone to the negative consequences of stress because they have depleted psychosocial resources.

This study confirmed that the impact of HF differently affects the physical and functional domains of QoL in patients with different educational backgrounds. Furthermore, it showed that HF patients with a low education report greater functional limitations in response to psychological stress compared to higher-educated patients.

## *Part 2*

In the second part of this thesis (*Chapter 5*), the attention shifted from the description of the relation between SES and the course of QoL in CHD towards the psychological factors which explain such a link.

In order to obtain a more comprehensive description of adjustment to illness, this study focused on the functional domains which were found to show socioeconomic disparities in chapter 3 (namely social, role and physical functioning). The study investigated the mediating effect of different facets of perceived control, such as mastery and self-efficacy, on the relation between SES and changes in functional status. Due to the unique prospective design of the study, changes in functional status could be closely followed between the pre-morbid assessment and the last follow-up (at 12 months after diagnosis). The analysis showed that, once the results had been adjusted for age, gender, severity of disease and comorbidity, SES accounted for differences in physical functioning, but not in social and role functioning. These findings confirmed the outcomes of the previous study (Chapter 3), where SES had a more pronounced influence on the course of physical functioning than on any other functional domain.

Self-efficacy mediated the previous relation, while mastery did not. Mastery and self-efficacy are both important for adjustment to CHD (Van Jaarsveld, Ranchor, Sanderma, Ormel, & Kempen, 2005), but they cover different aspects of perceived control. Mastery is a subjective aspect of control concerning the extent to which a person considers the events that occur in their life as being under their own control, as opposed to being fatalistic (Pearlin & Schooler, 1978). Self-efficacy, in contrast, has been defined as a construct of control which represents a person's conviction that outcomes can be influenced by his or her own behaviour, and can produce a determined response (Bandura, 1977; Skinner, 1996). The main distinction between the two constructs is that mastery pertains to a general feeling of being in control of personal forces that influence the direction of one's life, while self-efficacy concerns the confidence people have in using specific skills in order to produce determined outcomes (Kempen et al., 2005). In line with this definition, self-efficacy becomes particularly important in the regulation of health behaviours, such as adherence to treatments, dieting and rehabilitative exercise, which are necessary to maintain a good level of physical functioning after CHD. According to

the results of this study, CHD patients with high SES might be more confident of being able to accomplish specific tasks (i.e. have more self-efficacy) which ameliorate their physical condition in the long run.

Taken together, these findings suggest that the uneven distribution of psychological resources (such as perceived control) between socioeconomic groups explains, at least partially, changes in aspects of QoL among CHD patients.

### **Conclusions**

The following paragraphs will draw some overall conclusions on the basis of the results of the four studies presented in this thesis. The way in which cancer and CHD patients report dissimilar outcomes of QoL over time in relation to their SES will be discussed. This section will also examine the contribution of psychological, demographic and medical factors in determining such results.

*Socioeconomic disparities in QoL between different cohorts; disease-specific and generic characteristics.*

The main evidence in the first part of this thesis showed that there are some similarities and some differences in the course of QoL between cancer and CHD patients. Both cancer and CHD patients reported pre-morbid socioeconomic differences in depressive feelings, which disappeared after the diagnosis. In general, low SES is associated with a prevalence of depressive symptoms and longer persistence of depressive episodes (Lorant et al., 2003). However, the studies presented in this thesis suggest that the onset of a chronic condition is likely to modulate, rather than exacerbate, pre-morbid differences in depression between patients with different SES.

There is some evidence that cancer patients have an unexpected ability to adjust to life crises – returning to a normal level of depressive symptoms in the long term (Schroevers, Ranchor, & Sanderman, 2006). Depression, which is generally recognized as an important risk factor for the development of CHD (Goldston &



Baillie, 2008), has received far less attention in longitudinal research about CHD patients. However, in the present study, even though cancer and CHD patients seemed to deal quite well with depressive feelings over time, post-morbidly they showed no evidence of the socioeconomic disparities present in both the cohorts before the onset of the disease.

In general, the absence of socioeconomic differences in psychological domains is quite surprising. It might be expected that patients with high SES, who receive certain social support and have a higher level of control, would cope better with distressing situations over time (Kempen et al., 2005; Schroevers, Ranchor, & Sanderman, 2003b; Van Jaarsveld et al., 2005). However, the present study showed that cancer and CHD survivors with different SES do not seem to be extremely distressed by the onset of illness. This might be related to the specific age group included in this study. Previous research has shown that patients older than 65 years do not differ from a reference group in terms of psychological distress (Schroevers, Ranchor, & Sanderman, 2003a). Older patients are more likely to have accomplished many of their life goals and may therefore be more disengaged from social and personal demands or responsibilities than younger individuals (Aldwin, Sutton, Chiara, & Spiro, 1996). Furthermore, their greater maturity and considerable past experience of stressful life events may minimize disease-related distress (Mor, Allen, & Malin, 1994). However, although SES does not directly affect psychological distress, results of the third study suggest that high SES is associated with less impairment in role functioning due to psychological problems. Another result seen in both cohorts is that high SES patients reported higher levels of physical functioning after the diagnosis. Disparities in this domain for the CHD patients were already present pre-morbidly and were significant at the intermediate and long-term assessments, whereas for cancer patients such differences only appeared at the short-term and intermediate assessments. As expected, high SES was particularly beneficial to the physical functioning of both cohorts, because it is associated with greater engagement in health behaviours

(Chamberlain & O'Neill, 1998; Lynch, Kaplan, & Salonen, 1997; Muller, Danielzik, Pust, & Landsberg, 2006; van Oers, Bongers, van de Goor, & Garretsen, 1999) that are essential for the physical recovery from chronic conditions, but the positive effect of SES persisted only for CHD patients.

Despite these similarities, the cancer group generally reported fewer and less extended differences than the CHD cohort. Moreover, in the longitudinal analyses there was no evidence of different courses of adaptation between cancer patients with high and low SES, while CHD patients reported longitudinal differences in all the functional domains. Thus, in the present set of studies, SES influenced the course of QoL in CHD, while, in the case of cancer, SES was only accountable for a few cross-sectional differences.

Comparison of the results of the studies presented in this thesis suggests some possible reasons why the apparent influence of SES on QoL differed between patients with cancer and heart disease. To begin with, the first study investigated a small sample of cancer patients ( $n = 99$ ). As a consequence, the restricted number of participants included in the research could have given limited statistical power to detect differences.

Secondly, it is important to consider the diverse backgrounds and etiological factors of the two conditions. Although genes and behaviour are important in relation to the onset of both diseases, there are a few notable differences. Inherited factors, such as genetic mutations, can contribute to the development of some forms of breast, ovarian, colorectal, and other types of cancer. About 5% of all cancers are strongly hereditary, in that an inherited genetic mutation confers a very high risk of developing this condition. However, most cancers do not result from an inherited mutation but from a mutation that occurs during the individual's lifetime. Such mutations may be triggered by internal factors such as hormones or the metabolism of nutrients within cells, or external factors such as tobacco, chemicals and ultraviolet radiation. Although there is a positive relation between SES and medical screening (Wardle, McCaffery, Nadel, & Atkin, 2004), which

might facilitate early detection of the disease and consequently a higher chance of survival (Konski, Berkey, Ang, & Fu, 2003; Mackenbach et al., 2004), the contribution of SES-related psychosocial resources to the progression of disease remains questionable. Research has suggested that psychological distress, social support and psychosocial factors characterised by elevated catecholamine and cortisol levels might have an impact on cancer-related processes (Antoni et al., 2006; Lutgendorf et al., 2003). However, at yet there is no empirical basis for psychosocial and biobehavioural processes affecting cancer progression (Antoni & Lutgendorf, 2007). In fact, previous studies on this topic have not convincingly demonstrated the influence of any psychosocial factor on the initiation or progression of the disease (Garssen, 2002).

On the other hand, the progression of CHD is highly influenced by personal behaviour and lifestyle. Behaviour-related factors such as dietary patterns (diets high in saturated fats and cholesterol), use of tobacco, excessive alcohol intake and physical inactivity are considered major risk factors for the development of CHD. These factors contribute to the promotion of atherosclerosis and diabetes, increase levels of blood clotting elements, raise blood pressure levels and reduce the amount of oxygen the blood can carry, all of which are directly linked to the progression of the illness. As was seen in the fourth study (chapter 5), psychosocial resources, such as self-efficacy, which are unevenly distributed between socioeconomic strata, are essential for the regulation of health behaviours (Bastone & Kerns, 1995; Jeng & Braun, 1997; Mccann et al., 1995). In short, socioeconomic disparities in the course of the disease might be more visible in physical and functional domains for CHD patients than for cancer patients, because health-related psychosocial factors associated with SES have a larger impact on the progression of CHD.

*Psychological, socio-demographic and medical factors in relation to the QoL of cancer and CHD patients with different SES*

The present work explored the relation between SES and the course of QoL in cancer and CHD patients alongside a range of psychological, demographical and medical factors. Age, gender, comorbidity and severity of the disease, which were included as covariates in the studies, are all important determinants of QoL in chronic conditions, as are psychological factors such as the two constructs of perceived control.

Both age and gender have been found to be important determinants of QoL, in both the present research and in past research (Van Jaarsveld et al., 2005). However, age, which is usually considered a primary risk factor for both chronic conditions, was found to be related to SES and QoL only in CHD patients. On the other hand, female patients had lower SES and lower levels of some domains of QoL both for the cancer and CHD cohort. In the past, access to formal education and opportunities to reach senior professional positions were more limited for women. This explains why older patients are more likely to report larger socioeconomic disparities between the sexes compared to younger generations. In short, the different distribution of socioeconomic strata between male and female patients in the present samples partially reflects gender inequalities in QoL. Previous studies on the relation between gender, SES and health have pointed out the complexity of this field of research, since findings on this issue are still inconsistent and need further investigation (Matthews, Manor, & Power, 1999; Wu et al., 2003).

Disease severity corresponds to the level of suffering and impairment consequent to the onset of CHD. In three studies presented in this thesis, severity was measured in two ways: 1) by using the New York Heart Association's (NYHA) classification, which indicates the severity of cardiac symptoms by the level of complaints of breathlessness in relation to physical activities; 2) by gauging the left ventricular ejection fraction (LVEF), which represents the fraction of blood

pumped out of the left ventricle with each heartbeat. Both measurements were weakly related to SES, but moderately to QoL. On a clinical level, LVEF is considered a more accurate index of QoL in CHD and should be preferred to, or used in combination with, the NYHA classification.

In recent years, research on chronic disease and determinants of health has focused on the impact of comorbidity on patients' QoL. Patients diagnosed with multiple chronic conditions have to deal with an accumulation of disease burdens, resulting in worse outcomes in terms of QoL (Baumeister, Balke, & Harter, 2005). Similarly to disease severity, in this study comorbidity was weakly related to SES and moderately to QoL. In two studies (chapter 4 and 5), comorbidity was measured by calculating the number of active chronic conditions reported by the patients. In future work, besides a simple count of the number of chronic diseases accumulated by the patients, attention should be paid to the impact that those specific diseases have on QoL. Severe conditions such as stroke or obstructive pulmonary disease are likely to have a larger impact on health outcomes and on the course of QoL, compared to milder diseases such as asthma and minor forms of arthritis.

Finally, the contribution of psychological characteristics, such as perceived control, were examined in the second part of this thesis. As described earlier in this chapter, only self-efficacy mediated the relation between SES and changes in physical functioning in CHD patients, once the results had been controlled for all other covariates. The interaction between self-efficacy and other variables might have played a role in determining these outcomes. For instance, previous research (Pearlin, Nguyen, Schieman, & Milkie, 2007) has analysed the relation between age and mastery or age and self-efficacy. The sense of mastery perceived in late adulthood results from early life experiences and previous responses to challenging situations. Older people develop a life-course sense of mastery which is rooted in their past experience and remains quite unaltered by present conditions (Pearlin et al., 2007). Conversely, self-efficacy is a construct of control which is tied to the outcomes in specific domains, such as physical functioning.

Older people who are more prone to a decline in specific domains also report a decline in the corresponding self-efficacy (Lachman & Leff, 1989). The fact that self-efficacy is strongly related to the aging process could partially explain why self-efficacy, and not mastery, mediated changes in physical functioning.

The present study is in line with an increasing body of research which uses a multi-causal approach to evaluate QoL in chronic conditions. In order to fully understand the course of QoL in chronic patients, it is essential to take into account the complex interrelations between the main variable of the study (SES) and other determinants of health.

### **Methodological issues**

Several methodological issues relating to the four studies presented in this thesis merit further discussion: the sample characteristics, the prospective and longitudinal design of the studies, the different assessment points and certain considerations regarding causal relations in prospective and longitudinal research.

#### *Sample characteristics*

Participants of the studies in this thesis were mainly patients in their late adulthood. Three out of four of the studies presented (chapters 2, 3 and 5) originate from the Groningen Longitudinal Aging Study (GLAS) database, which was designed to measure QoL prospectively among older people. The inclusion criterion for the GLAS study was that patients had to be aged 57 years or older. The remaining study (chapter 4) regarded hospitalised patients with HF, which is a condition prevalent in the older population; 85% of the participants of this study were 57 years old or older. This is why changes in QoL have to be considered in relation to the age of the participants. It has previously been discussed that older people are less prone to psychological distress than younger patients when confronted with chronic conditions. It has also been suggested that perceived control is likely to change with age. However, it is important to remember that age

is primarily associated with risk of functional decline, mainly in older people (Hebert, 1997). Older adults are likely to experience the effects of health disparities more dramatically than any other age group. They are particularly at risk because they are more prone than younger people to develop chronic illnesses, may need frequent visits to medical facilities, and are more likely to have limited resources. Furthermore, available psychosocial resources become gradually more salient over an individual's lifetime in determining health disparities (Koster et al., 2006). Therefore, the theoretical implications of the present study should be limited to this specific stage of life, before being compared to research which incorporates patients of other age groups.

A second point regards sample attrition. In following the course of QoL, only the patients who completed all the assessments were included in the study samples. Obviously long-term adaptation to cancer and CHD could only be studied in patients who had a good prognosis, i.e. who survived until the last follow-up and had sufficiently good health condition to finish the study. In fact, when compared to non-participants, the patients who took part in the different studies were younger and better off in terms of social functioning, emotional distress, physical functioning, general well-being and comorbidity. It has been suggested that including only those patients who responded to all parts of the assessment in longitudinal studies might lead to an underestimation of socioeconomic disparities (van den Bos, Smits, Westert, & van Straten, 2002). Selective drop-out may have affected the results presented in this thesis, biasing our samples towards a subgroup of low SES patients with milder disease and less distress. However, the main goal of this thesis is to study the adjustment process during the course of QoL in chronic conditions, which, by definition, applies only to the patients who survived and were healthy enough to respond to the follow-up assessments. Therefore, considering the aim of this thesis, patient attrition is not a major limitation in this case. Furthermore, longitudinal studies disclose important

information over the process of selection which would remain unexplored in cross-sectional designs.

#### *Design of the studies*

The studies presented in the current thesis explore the course of QoL in cancer and CHD over different assessment points. Three studies (chapters 2, 3 and 5) used a prospective design, including a pre-morbid measurement of the patients and three follow-ups at 2, 6 and 12 months after the diagnosis. The third study (chapter 4) provided a baseline assessment at the patients' hospitalisation and three follow-ups at 1, 6, 12 and 18 months after their discharge. It is important to consider the implications of the design of these studies at a methodological level and on the interpretation of the results.

#### *Assessment points*

Patients adjusting to chronic conditions are confronted with specific physical and psychological burdens which emerge at specific points in time and are likely to be influential for QoL over the course of the illness. The assessment points used in the four studies presented in this thesis are believed to capture short (1-2 months), intermediate (6 months) and long (12-18) changes in the course of the disease.

The first two months after the onset of the disease are generally considered the most critical for the adjustment process. The diagnosis, the commencement of a new medical procedure and the effect of intensive treatments produce a strong response in terms psychological distress and physical detriment, which is the most acute phase of the disease (Stanton & Snider, 1993). The disease strikes so unexpectedly that patients are not able to rely on their usual resources, which in this thesis corresponded to a lack of socioeconomic disparities in the short-term assessments. A few months after the diagnosis (intermediate phase), patients experienced an improvement in QoL which typically continued for an extended period (Jenkins, 1992). In this phase, the psychosocial resources associated with



SES start to affect the outcomes of QoL. Over time, the impact of the disease lessens. SES and other factors, such as age and comorbidity, might then become more influential in determining the QoL of the patients.

However, different conditions and treatment modalities result in different paths of QoL over time (Jenkins, 1992). In the studies presented here, the course of QoL was measured by using fixed assessment points after the diagnosis, rather than referring to specific events related to the disease. Sometimes, points of assessments are chosen too routinely or based on global assumptions about the course of the disease. It has been suggested that, in order to properly investigate health-related issues in chronic patients, it would be more appropriate to use as reference points the different stages of the illness, such as diagnosis, hospitalization, surgery, discharge and the commencement of rehabilitation treatments (Heim, Valach, & Schaffner, 1997). Unfortunately, such an approach would require complex procedures and would be difficult to implement, except for limited samples and under specific conditions. On the other hand, including at least some measurements which are related to illness events would provide a more individual and disease-specific assessment of the patients over time, and should be recommended for future research.

#### *Causality and adaptation*

The main goal of the present longitudinal and prospective study was to draw some conclusions over the causal relation between SES and the course of QoL. Inferring a causal link between variables depends principally on the design of the study, rather than on the following analysis (Holland, 1986). Cross-sectional studies can only establish correlations between factors, while observational longitudinal studies may indicate which factors are associated with the development of a specific situation (risk factors). To draw a causal inference regarding the relation between two or more factors, a prospective study is necessary. Issues of causality are particularly salient when dealing with chronic conditions, since it is often

complicated to establish what is a direct consequence of the illness and what is not. Because three of the four studies presented in this thesis (chapter 2, 3 and 5) used a prospective design, it was possible to determine the causal relation between the onset of the disease and the course of QoL in relation to SES. The second study clearly showed that socioeconomic discrepancies in social and role functioning only arose after the diagnosis, while, concerning physical functioning, such differences were already seen in the pre-morbid assessment. In this case, the prospective design of the study allowed us to distinguish between socioeconomic differences which were caused by the onset of the disease and others which represented merely the re-establishment of pre-morbid conditions.

Similarly, in the first study the concept of adaptation was defined in reference to the pre-morbid condition of the patients. In previous research, adaptation to chronic conditions has been related to theoretical models displaying the coping strategies adopted by patients in order to limit the negative consequences of the disease (Livneh, 1999; Livneh, 2000). It was generally assumed that positive clinical and QoL outcomes during the course of the disease were the result of a beneficial adaptation process, but rarely have such outcomes been linked to the pre-morbid (healthy) situation of the patients (Haverkamp, Staab, Muller-Sinik, & Runger, 2004; Taylor, 2003). The first study presented here used as a reference the pre-morbid assessment of the patients, in order to measure fairly and compare between SES groups the degree of adaptation to cancer. In that study, adaptation to chronic conditions was defined as the patients' ability to minimize their disease-related loss in different domains of QoL, and maximize their subsequent recovery of QoL in order to regain their healthy (pre-morbid) levels. There are two important factors here: 1) the extent of recovery and 2) the time elapsed to reach such a condition. It remains open to debate whether the pre-morbid level of QoL corresponds to the ideal condition of the patients, which is not always the case (Davidson, O'Connell, Tondora, Lawless, & Evans, 2005; Taylor, 2003). Furthermore, low physical functioning and high psychological distress have been

found to be risk factors for the onset of cancer and CHD (Goldston & Baillie, 2008; Kubzansky & Thurston, 2007; Penedo, Schneiderman, Dahn, & Gonzalez, 2004), such that those people who experience a chronic condition are likely to report a lower level of QoL prior to the onset of the disease, compared to the general population. However, the diagnosis of cancer or CHD represents a crucial moment that is likely to change radically the life of the patient. Since the onset of a chronic condition is such a threatening event, recovering to the pre-morbid level of QoL remains a good approximation of the adaptive ability of the patient.

### **Theoretical and clinical implications**

The studies in this thesis are among the few to investigate socioeconomic inequalities in QoL after the diagnosis of a chronic condition, including pre-morbid data for most of the samples. Previous research has mostly focused on the role of SES as a risk factor for the development of chronic illnesses or as a predictor of mortality. To date, surprisingly little attention has been paid to the role of this important factor in regulating the health status, emotional distress and functioning of patients who survive the disease. Medical advances guarantee a longer survival expectancy for sufferers of major conditions, but in doing so they also prolong adverse health outcomes, the period of uncertainty and the consequences of the disease and its treatment. Therefore the longer-term well-being of survivors of cancer and CHD, among other conditions, is becoming an important issue for modern medicine.

#### *Cancer and the course of QoL: does SES really matter?*

Regarding cancer, the empirical literature on SES and QoL has produced inconsistent results. Some longitudinal studies on breast cancer patients reported no social class differences in psychiatric outcomes three months after mastectomy, but 12 months later women with lower SES had higher rates of psychiatric illness (Dean, 1987). A longitudinal study of American men with prostate cancer found

differences in QoL by income, but not education or health insurance coverage, six months post-diagnosis. Neither income nor education predicted QoL at subsequent follow-ups (Penson et al., 2001). Finally, a recent piece of research on a mixed-cancer group of British men and women showed that low SES was associated with heightened psychological distress and worse QoL two months after diagnosis, while in the long term (10 months after diagnosis) such disparities disappeared (Simon & Wardle, 2008). The literature on SES and course of QoL in cancer is quite limited, however, and perhaps it is not surprising that comparing studies on disparate samples (e.g. different cancer sites) leads to inconsistent results. A first suggestion for future research would be to focus on the association between SES and QoL in a range of cancer samples, to reveal whether the results are comparable between different cancer types. From the present study it is possible to conclude tentatively that, although all cancer survivors deserve the best possible health care, lower SES patients do not specifically represent a higher-risk group for poor QoL adjustment in the first year after diagnosis. On the contrary, the evidence reveals that, regardless of their SES, most cancer survivors demonstrate high resilience in the long term after diagnosis.

*CHD, SES and course of QoL: The contribution of psychological factors.*

CHD patients are more susceptible to socioeconomic inequalities in QoL in the long term. Previous longitudinal studies have pointed out that in older patients, CHD is mainly associated with a decrease in functional status, with the most severe consequences for physical domains (Masoudi et al., 2004; Van Jaarsveld, Sanderma, Miedema, Ranchor, & Kempen, 2001). A recent study on American CHD patients showed that a variety of indicators of low SES were associated with a decrease in exercise capacity, which corresponded to a worse prognosis in terms of cardiovascular recovery (Cohen, Vittinghoff, & Whooley, 2008). In line with previous research, the results in this thesis confirm the presence of dissimilar socioeconomic trends in functional domains for CHD patients. This adds to the

notion from previous research that poorer physical functioning in low SES patients should be seen as a pre-morbid condition, not a consequence of the illness.

The contribution of psychological resources is crucial in understanding SES-related disparities in CHD. Despite the fact that low-educated HF patients report poorer QoL in physical and functional domains, a differential response to psychological distress seems to be the key in determining socioeconomic inequalities in functional status. In this thesis, the same level of psychological distress resulted in a smaller increase in role functioning after hospitalisation in the very low-educated patients compared to the high-educated patients. In addition, in relation to the course of the disease, self-efficacy was found to be a potential instrument to limit the decrease in physical functioning over time in patients with low SES.

The work presented here suggests that future research and interventions should focus principally on the functional status of older CHD patients, particularly in relation to their physical domains. More attention should be paid to the underlying effect of distress on the health outcomes of patients with low SES. Moreover, the findings provide an empirical grounding for psycho-social interventions aimed at preventing the decline in physical functioning in low SES patients after the onset of CHD, by empowering the self-efficacy of this disadvantaged group.

In sum, this thesis addresses the lack of knowledge about the role of SES in the course of QoL in patients with chronic conditions. The cost of new treatments are a pressing concern for public health and new interventions need to demonstrate their necessity, effectiveness and feasibility. Future research should seek to identify subgroups of patients at risk of poor prognosis in terms of QoL and general well-being after the onset of a chronic illness. Although we have information on the independent effects of different determinants of health such as gender, age and comorbidity, little is known about the interrelation of these factors. In this thesis, some discussion was raised over the uneven distribution of gender across socio-economic groups, particularly in an aged population. It was also taken into

account that older people are more likely to develop multiple conditions, which is a common feature of patients with low SES. These issues deserve more theoretical attention and further empirical investigation in order to develop new models capable of explaining the course of QoL in response to chronic illness. Moreover, the results of this study can only be applied to a specific age group. Since age is related to changes in QoL, more research is needed on the impact of SES on the QoL of patients of different generations. Further evidence from younger patients would help build a more comprehensive evaluation of this topic.

Altogether, this research points to the conclusion that the influence of SES on the course of QoL is disease-specific and, in the long term, is relevant to CHD but not to cancer. Regarding CHD, most socioeconomic inequalities in the course of the disease are related to functional status, particularly physical functioning. However, due to the unique prospective design of the study it is possible to attribute disparities in physical functioning after diagnosis to pre-morbid conditions, rather than to the direct consequences of the disease. Regarding the role of psychological factors in the relation between SES and the course of QoL, two main findings emerged. 1) HF patients with different SES respond differently to the same level of psychological distress: high SES patients experience less impairment in role functioning, possibly due to an uneven distribution of resources between socioeconomic groups. 2) Self-efficacy is the only aspect of perceived control which mediates the relationship between SES and changes in physical functioning in CHD patients.

The results of this thesis could be used to provide guidelines for future investigations on QoL, or as empirical evidence for the planning of new interventions aimed at improving the QoL of specific groups of patients living with chronic conditions.

## Reference List

- Aldwin, C. M., Sutton, K. J., Chiara, G., & Spiro, A. (1996). Age differences in stress, coping, and appraisal: Findings from the normative aging study. *Journals of Gerontology Series B-Psychological Sciences and Social Sciences*, 51, 179-188.
- Antoni, M. H. & Lutgendorf, S. (2007). Psychosocial factors and disease progression in cancer. *Current Directions in Psychological Science*, 16, 42-46.
- Antoni, M. H., Lutgendorf, S. K., Cole, S. W., Dhabhar, F. S., Sephton, S. E., McDonald, P. G. et al. (2006). The influence of bio-behavioural factors on tumour biology: pathways and mechanisms. *Nat.Rev.Cancer*, 6, 240-248.
- Bandura, A. (1977). Self-Efficacy - Toward A Unifying Theory of Behavioral Change. *Psychological Review*, 84, 191-215.
- Bastone, E. C. & Kerns, R. D. (1995). Effects of self-efficacy and perceived social support on recovery-related behaviors after coronary artery bypass graft surgery. *Annals of Behavioral Medicine*, 17, 324-330.
- Baumeister, H., Balke, K., & Harter, M. (2005). Psychiatric and somatic comorbidities are negatively associated with quality of life in physically ill patients. *Journal of Clinical Epidemiology*, 58, 1090-1100.
- Chamberlain, K. & O'Neill, D. (1998). Understanding social class differences in health: A qualitative analysis of smokers' health beliefs. *Psychology & Health*, 13, 1105-1119.
- Cohen, B., Vittinghoff, E., & Whooley, M. (2008). Association of socioeconomic status and exercise capacity in adults with coronary heart disease (from the heart and soul study). *American Journal of Cardiology*, 101, 462-466.

- Davidson, L., O'Connell, M. J., Tondora, J., Lawless, M., & Evans, A. C. (2005). Recovery in serious mental illness: A new wine or just a new bottle? *Professional Psychology-Research and Practice*, 36, 480-487.
- Dean, C. (1987). Psychiatric Morbidity Following Mastectomy - Preoperative Predictors and Types of Illness. *Journal of Psychosomatic Research*, 31, 385-392.
- Ensel, W. M. & Lin, N. (1991). The Life Stress Paradigm and Psychological Distress. *Journal of Health and Social Behavior*, 32, 321-341.
- Gallo, L. C. & Matthews, K. A. (2003). Understanding the association between socioeconomic status and physical health: Do negative emotions play a role? *Psychological Bulletin*, 129, 10-51.
- Garssen, B. (2002). Psycho-oncology and cancer: linking psychosocial factors with cancer development. *Annals of Oncology*, 13, 171-175.
- Goldston, K. & Baillie, A. J. (2008). Depression and coronary heart disease: A review of the epidemiological evidence, explanatory mechanisms and management approaches. *Clinical Psychology Review*, 28, 288-306.
- Haverkamp, F., Staab, D., Muller-Sinik, K., & Runger, M. (2004). Methodological perspectives for the assessment of adaptation in chronic diseases, exemplified with asthma bronchiale in childhood. *Klinische Pädiatrie*, 216, 1-6.
- Hebert, R. (1997). Functional decline in old age. *Canadian Medical Association Journal*, 157, 1037-1045.
- Heim, E., Valach, L., & Schaffner, L. (1997). Coping and psychosocial adaptation: Longitudinal effects over time and stages in breast cancer. *Psychosomatic Medicine*, 59, 408-418.



Holland, P. (1986). Statistics and Causal Inference. *Journal of the American Statistical Association*, *81*, 945-960.

Jeng, C. & Braun, L. T. (1997). The influence of self-efficacy on exercise intensity, compliance rate and cardiac rehabilitation outcomes among coronary artery disease patients. *Progress in Cardiovascular Nursing*, *12*, 13-24.

Jenkins, C. D. (1992). Assessment of Outcomes of Health Intervention. *Social Science & Medicine*, *35*, 367-375.

Kempen, G. I. J. M., Ranchor, A. V., Ormel, J., van Sonderen, E., Van Jaarsveld, C. H. M., & Sanderman, R. (2005). Perceived control and long-term changes in disability in late middle-aged and older persons: An eight-year follow-up study. *Psychology & Health*, *20*, 193-206.

Konski, A., Berkey, B. A., Ang, K. K., & Fu, K. K. (2003). Effect of education level on outcome of patients treated on Radiation Therapy Oncology Group Protocol 90-03. *Cancer*, *98*, 1497-1503.

Koster, A., Bosma, H., van Groenou, M. I. B., Kempen, G. I. J. M., Penninx, B. W. J. H., van Eijk, J. T. H. N. et al. (2006). Explanations of socioeconomic differences in changes in physical function in older adults: results from the Longitudinal Aging Study Amsterdam. *Bmc Public Health*, *6*.

Kubzansky, L. D. & Thurston, R. C. (2007). Emotional vitality and incident coronary heart disease - Benefits of healthy psychological functioning. *Archives of General Psychiatry*, *64*, 1393-1401.

Lachman, M. E. & Leff, R. (1989). Perceived Control and Intellectual-Functioning in the Elderly - A 5-Year Longitudinal-Study. *Developmental Psychology*, *25*, 722-728.

- Livneh, H. (1999). Psychosocial adaptation to heart diseases: The role of coping strategies. *Journal of Rehabilitation*, 65, 24-32.
- Livneh, H. (2000). Psychosocial adaptation to cancer: The role of coping strategies. *Journal of Rehabilitation*, 66, 40-49.
- Lorant, V., Deliege, D., Eaton, W., Robert, A., Philippot, P., & Ansseau, M. (2003). Socioeconomic inequalities in depression: A meta-analysis. *American Journal of Epidemiology*, 157, 98-112.
- Lutgendorf, S. K., Cole, S., Costanzo, E., Bradley, S., Coffin, J., Jabbari, S. et al. (2003). Stress-related mediators stimulate vascular endothelial growth factor secretion by two ovarian cancer cell lines. *Clinical Cancer Research*, 9, 4514-4521.
- Lynch, J. W., Kaplan, G. A., & Salonen, J. T. (1997). Why do poor people behave poorly? Variation in adult health behaviours and psychosocial characteristics by stages of the socioeconomic lifecourse. *Social Science & Medicine*, 44, 809-819.
- Mackenbach, J. P., Huisman, M., Andersen, O., Bopp, M., Borgan, J. K., Borrell, C. et al. (2004). Inequalities in lung cancer mortality by the educational level in 10 European populations. *European Journal of Cancer*, 40, 126-135.
- Masoudi, F. A., Rumsfeld, J. S., Havranek, E. P., House, J. A., Peterson, E. D., Krumholz, H. M. et al. (2004). Age, functional capacity, and health-related quality of life in patients with heart failure. *Journal of Cardiac Failure*, 10, 368-373.
- Matthews, S., Manor, O., & Power, C. (1999). Social inequalities in health: are there gender differences? *Social Science & Medicine*, 48, 49-60.
- Mccann, B. S., Bovbjerg, V. E., Brief, D. J., Turner, C., Follette, W. C., Fitzpatrick, V. et al. (1995). Relationship of Self-Efficacy to Cholesterol-Lowering and Dietary Change in Hyperlipidemia. *Annals of Behavioral Medicine*, 17, 221-226.

Mor, V., Allen, S., & Malin, M. (1994). The Psychosocial Impact of Cancer on Older Versus Younger Patients and Their Families. *Cancer*, 74, 2118-2127.

Muller, M. J., Danielzik, S., Pust, S., & Landsberg, B. (2006). Socioeconomic gradients in health and overweight. *Ernährungs-Umschau*, 53, 212-+.

Pearlin, L. I., Nguyen, K. B., Schieman, S., & Milkie, M. A. (2007). The Life-course origins of mastery among older people. *Journal of Health and Social Behavior*, 48, 164-179.

Pearlin, L. I. & Schooler, C. (1978). Structure of Coping. *Journal of Health and Social Behavior*, 19, 2-21.

Penedo, F. J., Schneiderman, N., Dahn, J. R., & Gonzalez, J. S. (2004). Physical activity interventions in the elderly: Cancer and comorbidity. *Cancer Investigation*, 22, 51-67.

Penson, D. F., Stoddard, M. L., Pasta, D. J., Lubeck, D. P., Flanders, S. C., & Litwin, M. S. (2001). The association between socioeconomic status, health insurance coverage, and quality of life in men with prostate cancer. *Journal of Clinical Epidemiology*, 54, 350-358.

Schroevers, M., Ranchor, A. V., & Sanderman, R. (2006). Adjustment to cancer in the 8 years following diagnosis: A longitudinal study comparing cancer survivors with healthy individuals. *Social Science & Medicine*, 63, 598-610.

Schroevers, M. J., Ranchor, A. V., & Sanderman, R. (2003a). Depressive symptoms in cancer patients compared with people from the general population: The role of sociodemographic and medical factors. *Journal of Psychosocial Oncology*, 21, 1-26.

Schroevers, M. J., Ranchor, A. V., & Sanderman, R. (2003b). The role of social support and self-esteem in the presence and course of depressive symptoms: a

comparison of cancer patients and individuals from the general population. *Social Science & Medicine*, 57, 375-385.

Simon, A. E. & Wardle, J. (2008). Socioeconomic disparities in psychosocial wellbeing in cancer patients. *European Journal of Cancer*, 44, 572-578.

Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, 71, 549-570.

Stanton, A. L. & Snider, P. R. (1993). Coping with A Breast-Cancer Diagnosis - A Prospective-Study. *Health Psychology*, 12, 16-23.

Taylor, S. E. (2003). Moderators of the stress experience. In S.E.Taylor (Ed.), *Health Psychology* (5th ed., pp. 216-251). New York: Mc. Graw Hill.

van den Bos, G. A. M., Smits, J. P. J. M., Westert, G. P., & van Straten, A. (2002). Socioeconomic variations in the course of stroke: unequal health outcomes, equal care? *Journal of Epidemiology and Community Health*, 56, 943-948.

Van Jaarsveld, C. H. M., Ranchor, A. V., Sanderman, R., Ormel, J., & Kempen, G. I. J. M. (2005). The role of premorbid psychological attributes in short- and long-term adjustment after cardiac disease. A prospective study in the elderly in The Netherlands. *Social Science & Medicine*, 60, 1035-1045.

Van Jaarsveld, C. H. M., Sanderman, R., Miedema, I., Ranchor, A. V., & Kempen, G. I. J. M. (2001). Changes in health-related quality of life in older patients with acute myocardial infarction or congestive heart failure: a prospective study. *Journal of the American Geriatrics Society*, 49, 1052-1058.

van Oers, J. A. M., Bongers, I. M. B., van de Goor, L. A. M., & Garretsen, H. F. L. (1999). Alcohol consumption, alcohol-related problems, problem drinking, and socioeconomic status. *Alcohol and Alcoholism*, 34, 78-88.

Wardle, J., McCaffery, K., Nadel, M., & Atkin, W. (2004). Socioeconomic differences in cancer screening participation: comparing cognitive and psychosocial explanations. *Social Science & Medicine*, 59, 249-261.

Wu, J., Lie, Y. L., Rao, K. Q., Qian, J. C., Ye, R. W., Sun, Q. et al. (2003). Gender differences in education related health inequalities in Chinese northern rural areas: 1993 and 2001. *Journal of Epidemiology and Community Health*, 57, 506-507.